IT Unit 3

Topic 1

# Ch 1 Organisations & Data Management

**Characteristics of data types, p 22**

**Elaborate under each of the following data types:**

1. Text, (string)  
   Also referred to as alphanumeric, the majority of fields can be set as this data type, may also be referred to as ‘string’ in connection to coding, has a limit of 255 characters. Names and addresses are considered text data. Postcodes and phone numbers are normally formatted as text because they may contain spaces and are not intended to be used the same way as a numeric value.
2. Numeric – integer, floating point  
   These fields will only allow numbers to be entered. They are often used when the value is to be used in a calculation of some kind. For example, the quantity of an item purchased might need to be multiplied by its price to calculate the total amount required. This cannot be done in text format. Numeric fields can also be categorised in to different variations. ‘Integer’ refers to whole numbers, including negative numbers. Where decimals are required, when dealing with financial transactions or percentages for example, then the ‘floating point’ data type may be used.
3. Date  
   The value of the date is normally based on the number of days since the ‘zero’ day built in to the DBMS is. For example, day ‘1’ might be displayed as 01 January 1990, while ‘42673’ would be displayed as 30 October 2016.
4. Character   
   This text field will only accept a single alphanumeric character. It is used where there are multiple options for a value, but they can be represented as a single character to make data entry easier and to save storage space. For example, sizes can be listed as ‘S’, ‘M’, ‘L’, to represent small, medium, or large.
5. Boolean  
   Booleans are used when data falls in to categories that are answered by Yes/No, True/false, or even On/Off. It is often represented as a tick box on forums

**Databases and database terminology, p 23**

1. What is a database?  
   A database is a tool which is used to handle a range of data, from personal details to school results and financial transactions.
2. Explain the relationship between fields, records and tables.  
   A table consists of rows and columns, and in each row and column, there is a field which data can be entered. Tables also fit in to records because records contain information about one entity. The record goes in to the table to extract data from each field.
3. Explain the purpose of the following objects in a database: forms, queries, reports & macros.  
   A form allows an input screen to be formatted and linked to an underlying table. A query is used when you need to select a set of data. The result of a query is usually turned in to useable information by putting it in to a report. A report formats the query data and allows you to add summary statistics, such as totals, as well as headings, to make the information easier to read and understand. Procedures in a database can be automated to some extent by using macros. When run, a macro will carry out a set of predetermined task, such as printing a report.
4. What is the purpose of SQL?  
   An SQL (structured query language) is used as a way of standardising how data is managed in databases.
5. Distinguish between a flat file and a relational database? What are the advantages of using a relational data base?  
   A flat file database stores data in tables consisting of rows and columns, each with a field, and each row in a table holds a record, while a relational database stores data tables that are linked by a common field; relationships may be one-to-one, one-to-many or many-to-many.

**Relational databases, p 25**

1. What does RDBMS refer to?  
   RBDMS refers to Relational DataBase Management System.
2. Explain with eg.s the following different types of relationships between tables in a relational database.
   1. One-to-one relationship   
      A one-to-one relationship is used when a record in one table is connected to only one record in a second table.
   2. One-to-many relationship  
      A one-to-many relationship indicates that one record in the first table can be connected to more than one record in the second table.
   3. Many-to-many-relationship  
      A one-to-many relationship is used when each record in the first table can be connected to a number of records in the second table.
3. What is meant by a foreign key?  
   A foreign key is used when the primary key is in another table.

**Creating an RDMS structure, p 26**

1. Why is it important to consider how to structure the data in a database? What needs to be considered?  
   To maximise efficiency of the database.
2. What is the purpose of an entity relationship diagram? (go to p 28 to answer the following).  
   An Entity Relationship Diagram (ERD)is used by database designers to establish the interrelationships between different data elements. Once entities have been determined and their attributes identified, and ERD is created to show how entities relate to each other.
3. What are entities, use an eg. from p 28, and how are they represented?  
   Entities are anything from a single person, place or thing about which data can be stored. The example used in the book would be books, authors, readers and a library, which connect to phone numbers, addresses, names, titles, authors, authorIDs etc.
4. What are the attributes and how are they represented?  
   Attributes are represented by ovals within the example; a book’s attributes are its title, ISBN and the Date Published.
5. How are relationships represented?  
   Relationships are represented by diamonds within the example; books are *purchased by* the library, readers *borrow from* the library.
6. What is the difference between the Chen and Bachman models of representing ERD’s?  
   In Chen’s model, ERDs use a simple set of symbols, much like a flowchart, while the Bachman style will show the attributes in a table for each entity.